

### XIII. THE PLATED NEMATOGNATHS.<sup>1</sup>

BY MARION DURBIN ELLIS.

In the following pages are given a list of all known species of the Callichthyidæ, the "Sopra Serras," "Cascaduras," or "Hassars" as they are called by the natives of South America, and lists of the specimens at present in the collections of the Carnegie Museum and of the Indiana University.

The specimens in the Carnegie Museum were acquired through purchase from Mr. J. D. Anisits, who collected in Paraguay; from the expeditions of the Indiana University and Carnegie Museum to Guiana; and from the extended expedition of the Carnegie Museum through various parts of Brazil, Uruguay, Argentina, and Paraguay. The collections acquired from Dr. Anisits were enumerated in the ANNALS OF THE CARNEGIE MUSEUM, Vol. II, pp. 110-157. An account of the Guiana Expedition is given in Vol. V of the MEMOIRS. The expedition to Central South American is outlined in Volume VII of the ANNALS, pp. 285-314.

I have given a reference to the first description of each species, and, if this is incomplete, a reference to a better one.<sup>2</sup>

#### Family CALLICHTHYIDÆ.

*Callichthyoidei* BLEEKER, Nederl. Tijdschr. Dierk., I, 1863, 82.

*Siluridæ proterapodes* GÜNTHER, Cat. Fish. Brit. Mus., V, 1864, 4. *Hypostomatinae* in part.

<sup>1</sup> Contributions from the Zoölogical Laboratory of Indiana University, under the direction of C. H. Eigenmann, No. 123.

<sup>2</sup> After this paper had been finished, and before it could be published, Mr. C. T. Regan issued a revision of the genus *Corydoras* (inclusive of *Osteogaster*) with a list of the specimens in the British Museum (*Ann. and Mag. Nat. Hist.*, (8) X., 209-220, Aug., 1912), and Mr. Alipio de Miranda Ribeiro published Volume IV of his "Fauna Brasiliense, Peixes," and an account among other things of the *Callichthyidæ* in the "Historia Natural" of the "Comissão de Linhas Telegraphicas Estrategicas de Matto-Grosso ao Amazonas," Sept., 1912. The publication of these papers necessitated a partial revision of Mrs. Ellis' manuscript, which was done by Dr. Eigenmann. It is worthy of note that Regan's list contains fourteen species represented by seventy-four specimens. The collections examined by Mrs. Ellis contain sixteen species represented by over six hundred specimens. An additional species, *Hoplosternum magdalenæ* Eigenmann, is described in the appendix to this paper.—*Editor*.

*Callichthyidæ* GILL. Arrangement of Family of Fishes, 1872, 19.—EIGENMANN and EIGENMANN, South American Nematognathi, Occasional Papers, Cal. Acad. Sci., I, 1890, 449; A Catalogue of the Freshwater Fishes of South America, Proc. U. S. Nat. Mus., XIV, 1891, 43 and 44. EIGENMANN, Rept. Princeton Univ. Exp. Patagonia, III, 1910, 401-403.

The *Callichthyidæ* range from the Magdalena and Orinoco to the Rio de la Plata. The family is composed of ten genera containing forty-seven species, twenty-eight of which are placed in the genus *Corydoras*. Günther placed *Callichthys*, the single genus recognized by him, in the group *Hypostomatina* of his *Siluridæ proterapodes*. He gave brief descriptions of eleven species, which he suggests might well be arranged in three subgenera, *Callichthys*, *Scleromystax*, and *Corydoras*. Eigenmann and Eigenmann (l. c., 1890) recognize seven genera and twenty-five species. Their revision is the most complete account of the family published. It contains the complete synonymy up to 1890, with partial or complete descriptions of all species, as well as keys to the genera and species. The catalog published by the Eigenmanns in 1891 lists the same seven genera and twenty-five species. The list published in 1910 by Eigenmann includes the ten genera recognized in this paper and thirty-four of the species. The species added since 1910 are *Corydoras multimaculatus*, *C. ehrhardti* of Steindachner; *Corydoras kronei* Miranda Ribeiro; *Corydoras garbei*, *C. microps venezuelanus*, *C. meridionalis*, *C. nattereri*, *C. triseriatus*, and *C. flaveolus* of von Ihering; *C. micracanthus*, *microcephalus*, *polystictus*, *melanistius*, *undulatus*, *melanotænia*, and *macrosteus* of Regan; *Hoplosternum schreineri*, *Decapogon verissimi* and *urostriatum*, and *Corydoras virescens* of Ribeiro. The following are described as new in this paper: *Cascadura maculocephala*, *Chænothorax eigenmanni* and *Hoplosternum magdalænæ* Eig. (cf. Appendix). *Corydoras eigenmanni* von Ihering is considered synonymous with *Corydoras kronei* Miranda Ribeiro; *Corydoras meridionalis* von Ihering with *Corydoras ehrhardti* Steindachner; and *Corydoras microps venezuelanus* von Ihering with *Corydoras æneus* (Gill). Several of those described by Regan are probably also synonyms.

#### Genus SCLEROMYSTAX Günther.

##### 1. *Scleromystax barbatus* (QUOY and GAIMARD).

(Plate XXV, figs. 1-2.)

*Callichthys barbatus* QUOY and GAIMARD, Voy. Uranie et Phys., Zool., 1824, 234.  
—CUVIER and VALENCIENNES, Hist. Nat. Poiss., XV, 1840, 322 (Rio Janeiro)

- 3477 C. M. Two, 60 mm. (male) and 62 mm. (female), Iguape, São Paulo, Dec. 13, 1908. Coll. Haseman.

Genus *CALLICHTHYS* Linnæus.

2. *Callichthys callichthys* (Linnæus).

*Silurus callichthys* LINNÆUS, Syst. Nat., Ed. X, 1758, 307 (America).

*Callichthys callichthys* EIGENMANN and EIGENMANN, Occasional Papers, Cal. Acad. Sci., I, 1890, 452.

- 3458 C. M. Eight, 24 to 43 mm., Alagoinhas, Rio Catu, March 4, 1908. Coll. Haseman.
- 3459 C. M. Three, 98 to 102 mm. Penedo, Rio San Francisco, April 2, 1908. Coll. Haseman.
- 3460 C. M. Six, 40 to 105 mm. Entre Rios, June 1, 1908. Coll. Haseman.
- 3461 C. M. Six, 47 to 80 mm. Barra da Pirahy, July 5 and 12, 1908. Coll. Haseman.
- 3462 C. M. One, 89 mm. Cubatão, August 1, 1908. Coll. Haseman.
- 3463 C. M. Four, 78-134 mm. Xiririca, Rio Ribeiro da Iguape, in mud, Dec. 1, 1908. Coll. Haseman.
- 3464 C. M. One, 78 mm. Urucum Mts., Corumba, May 2, 1909. Coll. Haseman.
- 3465 C. M. One, 40 mm. Corumbá, April 27, 1909. Coll. Haseman.
- 3466 C. M. One, 136 mm. Iguape, Dec. 16, 1908. Coll. Haseman.
- 4883 I. U. M. One, 96 mm. Rio Grande do Sul. Coll. von Ihering.
- 9884 I. U. M. One, 48 mm. Campo Grande, June, 1901. Coll. J. D. Anisits.
- 10139 I. U. M. One, 158 mm. S. America. Coll. J. D. Anisits.
- 10150 I. U. M. Two, 80 and 104 mm. Bahia Negra. Coll. J. D. Anisits.
- 11302 I. U. M. Two, 94 and 100 mm. Trinidad, W. I.
- 1570 C. M., 11985 I. U. M. Small creek near Holmia, B. G., 1908. Coll. Eigenmann.
- 1571 C. M. One, Chipoo Creek, British Guiana. Coll. Wm. Grant.
- 1572 C. M. One, Nickaparoo Creek. Coll. Wm. Grant.
- 1573 C. M., 11986 I. U. M. Upper Essequibo River, British Guiana, 1908. Coll. Eigenmann.

1574 C. M., 11987 I U. M. Kumaka, Demerara, British Guiana.  
1908. Coll. Eigenmann.

### 3. *Callichthys arcifer* Hensel.

*Callichthys arcifer* HENSEL, Wieg. Archiv., 1868, I, 373 (Rio de Janeiro).

No specimens.

### CASCADURA,<sup>3</sup> gen. nov.

Breast as in *Callichthys*, mouth subterminal as in *Callichthys*. the occipital process not meeting the dorsal plate, the nuchal plates not meeting along the middle line between the dorsal and occipital process. Fontanels very large, the bridge between them over the eye. Anterior fontanel about as large as the eye, the posterior a little longer than the eye, cutting into the occipital bone. In general appearance this genus resembles *Hoplosternum*, from which it differs in its concealed coracoid processes.

### 4. *Cascadura maculocephala*, sp. nov. (Plate XXV, fig. 3.)

3539 C. M. Type, 66 mm. Uruguayana, Feb. 7, 1909. Coll. Haseman.

Head to end of opercle 3.3; depth 3.2; width 4; D. I, 7; A. I, 6; P. I + 8; lateral plates  $\frac{25}{23}$ ; eye 7 in the head, 3.8 in the interorbital space.

Deepest and widest at the base of the first dorsal rays. Snout depressed, body compressed. Dorsal profile quite steep to the dorsal, gently sloping downwards and backwards to the caudal. Ventral profile nearly straight to the anal, sloping abruptly back and upwards to the caudal; nuchal and lateral plates leaving a naked area above and below, 1.5 the width of the eye. Breast, belly and head covered with skin, only the upper half of the opercle naked.

Width of head 1.2 in its length, depressed in front; eyes lateral. Fontanel twice the length of the eye, a bridge at the middle over the eye, posterior fontanel cutting into the occipital. Isthmus jugular, 2.6 in the head. Snout blunt and square, its length 2.1 in the head. Upper lip vertical, overhanging the weak lower jaw. Teeth very

<sup>3</sup> Popular designation in parts of South America.

small, in a single row along the edge of the lower jaw, wanting above. Two long rictal barbels, the outer reaching the length of the eye beyond the base of the pectorals; the inner reaching twice the length of the eye beyond the base of the ventrals.

Naked area of the back and entire ventral side visible from the sides. Lateral plates not reaching the dorsal or anal by about half the diameter of the eye. An irregular row of twelve small azygous plates reaching from the adipose to the dorsal. Free edge of scutes armed with two irregular rows of stout spines; smaller backward directed spines scattered over the surface of the scutes near their middle.

Origin of the dorsal a little in front of the vertical from the base of the ventrals. Dorsal spine very weak, base of the dorsal 1.8 in the height of the longest ray, which is 3.2 in the length. Spine of the adipose reaching the base of caudal. Caudal the diameter of the eye longer than the head. Origin of the anal on the vertical from the fifth azygous plate in front of the adipose. Anal spine very weak; the longest ray reaching 1.5 diameters of the eye beyond the caudal. Pectorals 1.5 in the head, reaching a little beyond the base of the ventrals. Ventrals not reaching the anal by one diameter of the eye. Rays of the dorsal, anal, and caudal with short stiff bristles.

Color light gray above to dull yellowish below. Top of head gray with numerous dark brown spots. An interrupted row of dark spots down the lateral line. Ventral side white. Barbels and fins, especially the ventrals and pectorals, dusky to almost blackish.

#### Genus HOPILOSTERNUM Gill.

##### 5. *Hoplosternum littorale* Handcock.

*Hoplosternum littoralis* HANDCOCK, Zoölogical Jour., IV, 1828, 244 (Demerara).—

EIGENMANN and EIGENMANN, Occasional Papers, Cal. Acad. Sci., 1890, 456.

3467 C. M. One, 159 mm. San Luiz de Caceres, May 22, 1909. Coll. Haseman.

3468 C. M. One, 183 mm. Manãos. Nov. 25, 1909. Coll. Haseman.

3469 C. M. Four, 115 to 199 mm. Santarem, Dec. 6 and 7, 1909. Coll. Haseman.

One, 147 mm. Race course trenches, Georgetown, British Guiana, 1910. Coll. Ellis.

- 9886 I. U. M. One, — mm. Estancia la Armonia, January, 1900.  
Coll. J. D. Anisits.
- 9888, 9889 I. U. M. Two, 209 and 175 mm. Campos Grande.  
February, 1901. Coll. J. D. Anisits.
- 9890 I. U. M. One, about 147 mm. Matto Grosso or Asuncion.  
Coll. Dr. Carl Ternetz.
- 10152 I. U. M. One, 88 mm. Bahia Negra. Coll. J. D. Anisits.
- 11304 I. U. M. One, 195 mm. Trinidad, W. I.
- 1585 C. M., 11993 I. U. M. Botanic Garden, Georgetown, British  
Guiana, 1908. Coll. Eigenmann.
- 1576 C. M., 11988 I. U. M. Georgetown Market, British Guiana,  
1908. Coll. Eigenmann.
- 1575 C. M. One, 192 mm. Mahaica, 1908. Coll. Eigenmann.

6. **Hoplosternum thoracatum** (Cuvier and Valenciennes).

- Callichthys thoracatus* CUVIER and VALENCIENNES, Hist. Nat. Poiss., XV, 1840, 309,  
pl. 443 (Mana, Martinique).
- Hoplosternum thoracatum* Gill, Ann. Lyc. Nat. Hist. New York, VI, 1858, 36;—  
EIGENMANN and EIGENMANN, Occasional Papers, Cal. Acad. Sci., I, 1890, 458.
- 3470 C. M. One, 38 mm. San Luiz de Caceres, May 24, 1909.  
Coll. Haseman.
- 3471 C. M. Seven, 31 to 45 mm. Maciel, Rio Guaporé, July 9 and  
28, 1909.
- 3472 C. M. One, 75 mm. (without caudal). San Joaquín, Bolivia,  
in a mud-hole, Sept. 7, 1909. Coll. Haseman.
- 3473 C. M. Two, 171 and 174 mm. Manãos, Nov. 26 and 27, 1909.  
Coll. Haseman.
- 3474 C. M. Seven, 45 to 172 mm. Santarem, Dec. 7 and 20, 1909.  
Coll. Haseman.
- 3475 C. M. One, 180 mm. Bragança, Dec. 29, 1909. Coll.  
Haseman.
- 3476 C. M. Four, 79 to 90 mm. San Francisco, June 10, 1909.  
Coll. Haseman.
- Four, 60 to 70 mm. Gluck Island, British Guiana, 1910.  
Coll. Ellis.
- 4229 I. U. M. 173 mm. Tabatinga.
- 2084 I. U. M. One, 108 mm. Cudajas.
- 1577 C. M., 11989 I. U. M. Chipoo Creek, British Guiana, 1908  
Coll. Wm. Grant.

- 1578 C. M. One, below Packeoo Fall, 1908. Coll. Wm. Grant.  
 1579 and 1580 C. M., 11990 I. U. M. Gluck Island, British Guiana,  
 1908. Coll. Eigenmann.  
 1581 C. M., 11991 I. U. M. Kumaka, Demerara, British Guiana,  
 1908. Coll. Eigenmann.  
 1582 C. M., 11992 I. U. M. Mud Creek in Aruka River, British  
 Guiana, 1908. Coll. S. E. Shideler.  
 1583 C. M. Two, probably Chipoo Creek, 1908. Coll. Wm. Grant.  
 1584 C. M. One, Botanic Garden, Georgetown, British Guiana,  
 1908. Coll. S. E. Shideler.

### 7. *Hoplosternum melampterum* (Cope).

- Callichthys melampterus* COPE, Proc. Acad. Nat. Sci. Phila., 1871, 275, Pl. XIV,  
 fig. 4 (Ambyiacu River).  
*Hoplosternum melampterum* EIGENMANN and EIGENMANN, Occasional Papers, Cal.  
 Acad. Sci., I, 1890, 455, in key only.  
*Callichthys pectoralis* BOULENGER, Proc. Zool. Soc. London, 1895, 525.  
 10151 I. U. M. Two, 54 and 77 mm. Corumbá. Coll. Anisits.  
 10199 I. U. M. Two, 27 and 34 mm. (without caudal), Rio Paraguay.  
 Coll. Anisits.  
 9855 I. U. M. One, 72 mm. (without caudal), Rio Branco, Matto  
 Grosso, 1895. Coll. Anisits.

### 8. *Hoplosternum schreineri* Ribeiro.

- Hoplosternum schreineri* RIBEIRO, Fauna Brasiliense, Peixes, IV, 1912, 150 (Pará).

## Genus DECAPOGON Eigenmann and Eigenmann.

### a. Caudal uniform.

- b. Barbels extending beyond tips of pectorals. . . . . *adpersum* (Steindachner) 9.  
 bb. Barbels not reaching margin of opercle. . . . . *verissimi* Ribeiro. 10.  
 aa. Caudals with five parallel bands. . . . . *urostriatum* Ribeiro. 11.

### 9. *Decapogon adpersum* (Steindachner).

(Plate XXXI, figs. 2, 2a, 2b.)

- Callichthys adpersus* STEINDACHNER, "Ichthyologische Beiträge," V, 1876, 87, Pl.  
 XI, figs. 2-2b (Santarem to Tabatinga).  
*Decapogon adpersum* EIGENMANN and EIGENMANN, Occasional Papers, Cal. Acad.  
 Sci., I, 1890, 461.  
 3454 C. M. One, 122 mm., Santarem, Dec. 7, 1909. Coll. Haseman.  
 4225 I. U. M. One, 85 mm. (to base of caudal only), Brazil.

10. *Decapogon verissimi* Ribeiro.

*Decapogon verissimi* RIBEIRO, Fauna Brasiliense, Peixes, IV(1), 1912, 154 (Pará).

11. *Decapogon urostriatum* Ribeiro. (Plate XXVI, fig. 1.)

*Decapogon urostriatum* RIBEIRO, Comm. Linhas Tel. Est. de Matto-Grosso ao Amazonas, Anexo, No. 5, Hist. Nat. Zool., 1912, 16 (Manãos).

[This species was described as new by Mrs. Ellis in her manuscript, and as the above cited description is not readily accessible, the following description may stand.—*C. H. Eigenmann.*]

3540 C. M. One, 140 mm. Manãos, Nov. 27, 1909. Coll. Haseman.

3541 C. M. Two, 136 to 145 mm. Manãos, Nov. 27, 1909. Coll. Haseman.

Head to the end of the opercle 3.5; depth 3.5; width 4.5; D. I, 7; A. I, 5; lateral plates  $\frac{25}{25}$ ; eye 6 in the head, 3.5 to 3.7 in the inter-orbital.

Deepest and widest below the dorsal spine. Dorsal profile steep in front of the dorsal, thence almost straight to the adipose. Ventral profile gently bowed. The caudal peduncle sharply constricted, and quite narrow. Scutes leaving a naked strip in front of the anal. Coracoid processes meeting below, leaving a narrow wedge-shaped naked strip between them in front and a similar longer one behind. The left coracoid overlaps the right in the largest specimen.

Width of head 1.5 in its length, depressed in front; eyes lateral, suborbital exposed. Fontanel making a shallow niche in the occipital. Eye 1.25 to 1.5 in the fontanel. Isthmus close to the coracoid 3.5 to 4.5 in the head. Snout narrowly rounded, 2 to 2.2 in the head, 2.8 in its distance from its tip to the dorsal. Mouth narrow, slightly inferior. Teeth wanting above; in a narrow band below. Two long rictal barbules, the outer just reaching the opercle, the inner almost reaching the posterior margin of the scapula. Two pairs of short barbules and a rudiment of a third pair on the lower lip; the outer, longest, half as long as the diameter of the eye.

Scutes entirely covering the sides; four to seven azygous plates in front of the adipose dorsal. Free edges of the scutes slightly ctenoid, their surface hispid.

Dorsal spine strong and flattened, 4.5 to 5 in the length. Third dorsal ray longest, equal to the dorsal spine. Tip of anal reaching—



or not quite reaching—the caudal. Anal spine short, or not quite equal to the eye; first anal ray with short stiff bristles. Pectoral spine heavy, with retrorse teeth on its inner margin and short stiff antrorse hairs without; about 4 to 4.5 in the length; reaching or not quite reaching the ventrals. Ventrals short, about five in the length. Caudal very deeply emarginate, the diameter of the eye less than the head.

Light brown, yellowish below, two to four dark brown spots behind the eye. A whitish spot at the ventral end of each of the upper series, and at the dorsal end of each of the lower series of lateral plates, forming a whitish stripe graduated from the head caudal. Dorsal, pectorals and ventrals dusky. Caudal spot blackish, continued to the tips of the middle caudal rays. Caudal when expanded with five parallel, horizontal black stripes, the middle on the middle caudal rays, the next ones, from the accessory rays across the rays to the tips of the third and fourth above and below the middle. The outer two bands across the lobes near their tips. Anal whitish with two diagonal blackish bars including the spine, the first rays, and the tips of the last rays. Adipose blackish along its free margin.

Genus *DIANEMA* Cope.

12. *Dianema longibarbis* Cope.

*Dianem alongibarbis* COPE, Proc. Acad. Nat. Sci. Phila., 1871, 276, pl. 7, fig. 1-15 (Ambyiacu River).

No specimens.

Genus *CHÆNOTHORAX* Cope.

13. *Chænothorax taiosh* (Castelnau).

*Callichthys taiosh* CASTELNAU, Anim. de l'Am. du Sud, Poissons, 1855, pl. 19, fig. 1.

*Brochis taiosh* EIGENMANN and EIGENMANN, Proc. Cal. Acad. Sci., 2d Ser., I, 1888, 165 (name only).—EIGENMANN and EIGENMANN, Occasional Papers, Cal. Acad. Sci., I, 1890, 463, in key.

*Chænothorax taiosh* EIGENMANN, Rept. Princeton Univ. Exp. Patagonia, III, 1910, 403 (name only).

No specimens.

14. *Chænothorax bicarinatus* Cope.

*Chænothorax bicarinatus* COPE, Proc. Am. Philos. Soc., 1878, 679 (Peruvian Amazon).

No specimens.

15. *Chænothorax semiscutatus* (Cope).

*Corydoras semiscutatus* COPE, Proc. Acad. Nat. Sci. Phila., 1871, 280, pl. 6, fig. 1 (Ambyiacu River).

*Chænothorax semiscutatus* EIGENMANN, Rept. Princeton Univ. Exp. Patagonia, III, 1910, 402.

No specimens.

16. *Chænothorax eigenmanni*<sup>4</sup> sp. nov. (Plate XXVI, fig. 2.)

3542 C. M. Type, 51 mm. Caceres, May 26, 1909. Coll. Haseman.

3543 C. M. Cotype, 55 mm. Caceres, May 26, 1909. Coll. Haseman.

Head 2.9 to 3; depth 2.7; width 5; D. I, 12; A. I, 6 or 7; P. I, 7; lateral plates  $\frac{24}{22}$ ; eye 3.5 to 3.7 in the head, 1.7 in the interorbital.

Compressed throughout, dorsal profile only slightly arched from the snout to the base of the dorsal plate. Scutes leaving a naked area along the ventral side, and along the dorsal side in front of the adipose. Coracoid processes reaching backwards almost to the ventral and not expanded on the breast, leaving a naked area equal to the eye in width in front of the ventrals.

Entire snout and suborbitals unmailed. Eyes lateral, interorbitals slightly convex; fontanel long, 1.5 times the eye, not quite reaching the nares in front, just reaching the base of the occipital process behind. Occipital process weak, reaching little more than half the distance from its base to the dorsal. Eye 2.5 in the pointed snout. Mouth small. A pair of equal barbels at the rictus, reaching back to the vertical from the middle of the eye or a little beyond, fused at the base for a distance of half the length of the eye. A pair of short barbels, two-thirds the length of the eye, at the symphysis.

Scutes almost entirely covering the sides. One very small azygous plate just in front of the adipose. The distal half of the exposed parts of the scutes roughened with short backwardly directed spines.

Dorsal spine equidistant from the snout and the upper caudal lobe; slender, curved backwards; smooth in front, toothed behind; 1.3 to 1.4 in the head; about equal to the first rays. Base of the dorsal a little less than the head; last dorsal rays reaching the adipose.

<sup>4</sup>Named for Dr. C. H. Eigenmann, under whose care and direction this paper and my paper on the genera *Hemigrammus* and *Hyphessobrycon* have been written.

Adipose spine very straight, slightly longer than the eye; slightly less than the base of the fin. Anal spine weak, rough in front. First three anal rays longest, reaching well beyond the base of the caudal. Pectoral spine straight, equal to the dorsal spine, smooth on the outer side, toothed within. Pectorals long, reaching to the middle of the short ventrals. Ventrals reaching the second scute in front of the anal in the cotype, much shorter in the type. Caudal forked, upper lobe longest, 2.3 in the length.

Dark above, yellowish on the belly and lower one-third of the sides, whitish under the head and along the lateral line. Pectoral spine dusky, pectoral and caudal light. Dorsals, anal, and ventrals with a distinct reddish tinge not quite as dark as the upper parts of the body.

Genus BROCHIS Cope.

17. *Brochis dipterus* Cope.

*Brochis dipterus* COPE, Proc. Acad. Nat. Sci. Phila., 1871, 278 (Ambyiacu River).

No specimens.

18. *Brochis cœruleus* Cope.

*Brochis cœruleus* COPE, Proc. Acad. Nat. Sci. Phila., 1871, 277, pl. 7, fig. 2, and pl. 4, fig. 3 (Ambyiacu River).

No specimens.

Genus ASPIDORAS von Ihering.

19. *Aspidoras rochai* von Ihering. (Plate XXVI, fig. 3.)

*Aspidoras rochai* VON IHERING, Notas Prelim., I, 1907, 30.

3455 C. M. Three, 23-34 mm. (without caudal), Rio Agua Branca, Nov. 6, 1907. Coll. Haseman.

3456 C. M. One, 42 mm., Rio Zinga, Nov. 7, 1907. Coll. Haseman.

3457 C. M. Five, 31-48 mm. Rio Paiaia, Nov. 8, 1907. Coll. Haseman.

Genus CORYDORAS Lacépède.

KEY TO THE SPECIES OF CORYDORAS.

a. Caudal plain.

- b. Coracoid processes moderately expanded on the breast in both sexes, leaving only a narrow naked area between them; occipital process triangular, pointed at the tip; a dark band extending from the upper caudal lobe forward, one or more longitudinal series of dark spots along the sides near the lateral line. . . . *elegans* Steindachner. 20.

*bb.* Coracoid process scarcely encroaching on the breast or belly, the naked area more than a third as wide as the distance between the base of the pectoral spines (except in large specimens of *armatus*).

*c.* Sides of the body with a median longitudinal stripe.

*d.* Eye 1.5 in the snout, 4 in the head, 2 in the interorbital. First two dorsal rays as long as the dorsal spine. Occipital process truncate, about twice as wide at the base as at the tip. Lateral stripe extending from the middle caudal ray forward, distinct and constant. "Head 3.5, depth 2.6 to 2.8; D. I, 7-8; A. I, 7; V. 6; P. I, 6-7. Lateral plates  $\frac{23}{20}$ ."

*nattereri* Steindachner. 21.

*dd.* Eye 2 in the snout, 3.5 in the head, 1.3 in the interorbital. First dorsal ray only as long as the dorsal spine. The width of the occipital process at its base about equal to its length, about three times its width at its tip. Lateral band dusky, not intense. Head 3.5; depth 3; D. I, 7.5; A. I, 6.5; lateral plates  $\frac{24}{22}$ .....*juquia* von Ihering. 22.

*ddd.* Eye 2-2.25 in the snout, 4-5 in the head, 2-2.5 in the interorbital. First three to five dorsal rays as long as the dorsal spine. Tip of the occipital process narrow, about 4 in the length, or the width of its base. Lateral stripe wide, variable in intensity, sometimes weak near the caudal, Head 2.6-3.8; depth 2.5 to 3; D. I, 7-8; A. 7-8; P. I, 8-9; V. 6; lateral plates  $\frac{22-23}{20}$ .

*microps* Eigenmann & Kennedy. 23.

*dddd.* Eye 2.75 in the snout, 5.5 in the length, about 2 in the interorbital. Snout 2 in head; suborbital a little narrower than diameter of eye; barbel nearly or quite reaching gill-opening. Dorsal I, 7; spine about three-fifths length of head, three or four rays longer than spine; edge of fin slightly convex; base nearly equal to distance from adipose fin, which is preceded by three or four median scutes. Anal I, 6. Pectoral spine extending to base of pelvic. Scutes 24/22; humeral shields widely separated below, and each separated by one scute from base of pelvic fin. Brownish above, yellowish below; a broad blackish lateral band; fins immaculate. Habitat Colombia (Regan).

*melanotania* Regan. 24.

*dddd.* Eye 3 in the snout, 6 in head, 3 in the interorbital; suborbital 1.5 the diameter of the eye; barbels reaching gill-opening; occipital plate longer than broad. D. I, 7, spine .5 of length of head or less, five or six rays longer than the spine; base less than distance from adipose, which is preceded by three or four median scutes; A. I, 6; pectoral spine to base of pelvis.

Scutes  $\frac{23-24}{23-21}$ ; humeral shields not in contact, separated by one scute from base of pelvic fin. Brownish above, yellowish below; a broad dark lateral band tapering backwards. Fins dusky (Regan).....*macrosteus* Regan. 25.

cc. Sides of the body without a longitudinal stripe.

e. Body without small spots, with or without a large dark blotch under the dorsal.

f. Dorsal spine weak, slightly decurved, very little longer than the snout; 2 or more in the head. Depth 2.8 to 4; head 3.6, eye 2 in the snout, 2-2.5 in the interorbital, 4.5 to 4.75 in the head. Base of the dorsal shorter than the distance between the dorsal and adipose. Four or five azygous plates. Dark above, light below; usually the first seven or eight scutes are dark, forming a large blotch under the dorsal; opercle, humeral, and nuchal plates iridescent blue. D. I, 7; A. I, 6; lateral plates  $\frac{22}{20}$ .....*æneus* (Gill). 26.

ff. Dorsal spine straight and well developed; longer than the snout plus the diameter of the eye; 1.2 in the head. Depth 3 to 2.5; eye 1.5 to 2 in the interorbital.

*virescens* Ribeiro. 27.

ee. A row of small blackish, often bluish, iridescent spots down either side of the lateral line, upper scutes with small scattered more or less rectangular spots. Dorsal spine very strong, equal to the depth, 2.3 to 2.8 in the length. Pectoral spine not so long. Eye large, 1.5 in the snout, 1.75 in the interorbital and 3-3.25 in the head. Base of the dorsal equal to the distance between the dorsal and adipose. Caudal peduncle rather sharply constricted. D. I, 7; A. I, 6; P. I, 7-8; V. 6; four to five azygous plates.....*armatus* (Günther). 28.

ecc. Longitudinal series of small dark spots on sides of body and on rays of dorsal fin; other fins immaculate. Head 3.25-3.5; depth 2.33-2.5; snout strongly decurved, a little longer than diameter of eye; eye 3 in head, 1.5 in interorbital; suborbital narrow; barbel nearly reaching gill-opening. D. I, 7; spine nearly as long as head, soft rays decreasing from first, which is as long or a little longer than spine; two azygous plates in front of adipose; A. I, 6; pectoral spine as long as head, extending to middle of ventrals. Plates  $\frac{21-22}{19-20}$  (Regan).

*polystictus* Regan. 29.

aa. Caudal with vertical cross-bars.

g. Sides without dark markings, or with a dark stripe or a few large spots along the middle of the upper series of scutes. One to three or four large spots lying across the lateral line in two species and a single spot below the lateral line in another. Anal unmarked. Head plain.

- h.* Head and body without dark markings.
- i.* No azygous plates, adipose spine without fin; a faint pale band on each side; clavicle and operculum with blue reflections; a large black spot on the distal part of the dorsal rays. Head 3.1, 1.3 in the depth; D. I, 7; A. I, 6; V. 6; P. 1.5; lateral plates  $\frac{22}{21}$ ; eye 3 in the head, 1.33 in the interorbitals (Cope). *acutus* Cope. 30.
- ii.* Three or four azygous plates in front of the adipose. Top of the head brown, a yellowish band across the eyes, body otherwise without color. Dorsal with five longitudinal rows of dark spots. Head 4; depth 3; D. I, 7; A. 7; V. 6; P. I, 9. Lateral plates  $\frac{23}{20}$  . . . . . *aurofrenatus* Eigenmann & Kennedy. 31.
- hh.* Body with a dark stripe or a few large dark blotches.
- j.* Dorsal spine less than 2 in the head, a little longer than the pectoral spine.
- k.* "Fontanel long, reaching forward to the anterior border of the eye, backwards to the base of the occipital process. Four or five azygous plates. Strongly compressed, head and depth nearly equal, 3 to 2.5 in the length. Snout 1.3 to 1.5, eye 4.5 to 5, and interorbital 3 to 3.75 in the head. A blackish gray stripe along the upper half of the body, beginning just under the dorsal and ending on the base of the caudal. Upper scutes each with a dark vertical bar. Near the upper end of the first five to ten lower plates is a blackish spot or short oblique stripe. Dorsal plain. D. I, 8; V. I, 6; C. 16; A. I, 7; P. I, 10; lateral plates  $\frac{23}{21}$ ." (Steindachner) . . . . . *treillii* Steindachner. 32.
- kk.* Fontanel small, not reaching the occipital process. Two or three, rarely four, azygous plates. Body slender, depth 3 to 3.1; head 3 to 3.25 and 3.5; eye 3.5 to 4 in the head, 1.6 to 1.7 in the interorbital, and 1.5 in the snout. Interorbital 2.2 to 2.3 in the snout. A very large blackish brown spot on the anterior part of the body, frequently reaching back to the second or third dorsal ray, usually broader below, ending on the lower side of the lateral line. A second smaller longer dark spot lies along the lateral line in the vicinity of the adipose; often a small caudal spot, which sometimes fuses with the other spots. D. I, 8; A. 7; V. 7; lateral plates  $\frac{22 \text{ or } 23}{21 \text{ or } 20}$  (Steindachner).  
*chrhardti* Steindachner. 33
- jj.* Dorsal spine about 2 in the head, the diameter of the eye less than the pectoral spine and about equal to the fourth or fifth dorsal ray. Fontanel slender and rather long. Depth 3.2 to 3; head 3.3. Snout long and pointed, 1.6 in the head, quite steep in front.



Eye 3 in the snout, 4.6 in the head and 1.5 in the narrow interorbital. Three indistinct spots along the back, at the base of the dorsal spine and first dorsal rays and base of the last dorsal rays and at the base of the adipose spine. Spots often confluent; many small scattered chromatophores over the head and sides. Dorsal with three or four cross-bars. D. I, 8; A. I, 6;

lateral plates  $\begin{smallmatrix} 23 \\ 21 \end{smallmatrix}$  ..... *flaveolus* von Ihering. 34.

gg. Sides variously striped or spotted; most species with a series or a few scattered spots below the lateral line. Dorsal always and anal usually marked. Usually some grouping of the chromatophores on the face.

l. A large intense black spot at the base of the dorsal spine, or on the first few dorsal rays, or on both.

m. Dark spot at the base of the dorsal spine, sides of the body with numerous small black dots.

n. Anal plain; a black spot at the tip of each dorsal ray. The small dark dots on the sides lacking along the lateral line; Face with blue reflections. Form stout, profile steep in front. Head 3 in the length; 1.4 in the depth; eye 3 in the head, 1.6 in the interorbital. Dorsal spine long, reaching the adipose when depressed. Four flat azygous plates. D. I, 7; A. I, 6; V, 6; P. I, 7. lateral plates  $\begin{smallmatrix} 21 \\ 19 \end{smallmatrix}$  (Cope)..... *amphibelus* Cope. 35.

nn. Anal barred, or spotted, or hyaline, dorsal or part of dorsal dark, the color sometimes extending upon the sides below. Occiput and a bar through the eyes continued on the cheeks blackish. Opercle and humeral process silvery. Depth 2.6 to 3; head 3.25-3.33; eye large, 1.5 in the snout, 3.3-4 in the head, 1.66 in the interorbital, two to four azygous plates. Dorsal spine about equal to the head. D. I, 7 or 8; A. 7 or 8; V. 6; P. I, 8-9; lateral plates  $\begin{smallmatrix} 23-25 \\ 21-23 \end{smallmatrix}$ .

*punctatus* (Bloch). 36.

mm. Dark spot in the anterior part of the dorsal fin. Sides with several longitudinal rows of small spots.

o. An indefinite light stripe along the lateral line, anal with dark spots or small dark dots.

p. A series of small spots in the light stripe along the lateral line, upper parts of the head, upper two-thirds of the body, caudal, dorsal, adipose, and anal with gray (iridescent in life) point-like dots, snout short; fontanel short; eye very small, 4 in the head. Interorbital equal to the snout, 2 in the head. Dorsal spine shorter than the pectoral spine. Pectoral spine equal to the head. Three azygous

plates. Depth at genital opening 2.5 to 2.6; head 3 to 3.3; D. I, 8; A. I, 6; P. I, 8-9; lateral plates  $\frac{21}{20}$

(Steindachner) . . . . . *julii* Steindachner. 37.

*pp.* Body brownish above the pale lateral stripe, yellowish to white below. Three longitudinal series of small dark spots along the side. Black dorsal spot over the entire length of the first three rays, the rest of the dorsal whitish, with several oblique series of small dark spots, some at the tips of the rays. Anal with two or three series of small spots. Fontanel oval, small. Eye 4 in the head, 2 in the interorbital; snout 1.75 in the head. Dorsal spine slender, shorter than the pectoral spine, which equals the distance from the tip of the snout to the posterior margin of the eye. Three azygous plates. Head 3; depth 2.5 to 2.6; D. I, 7; A. I, 6-7; V. I, 5; P. I, 9; lateral plates  $\frac{23}{21}$ . (*agassizii* Steindachner).

*trilineatus* Cope. 38.

*ppp.* A series of three to six dark brownish or purplish spots along the side and a second series on the back; dorsal dusky anteriorly, sometimes with spots on rays; lower fins immaculate. Head 4; depth 3-3.5; eye 2.5-3 in the snout or interorbital, 6-7 in the head; suborbital narrow; barbels nearly or quite reaching gill-opening. Dorsal I, 8; spine one-half the length of head; fin small, rounded, its base less than its distance from adipose fin, which is preceded by one or two median scutes. Anal I, 6. Pectoral spine not reaching base of pelvic fin. Scutes 25/22; humeral shields widely separated below, each separated by two scutes from base of pelvic fin. Yellow, with a series of three to six dark brownish or purplish spots along the side and a second series on the back; dorsal dusky anteriorly, sometimes with spots on rays; caudal barred; lower fins immaculate. 1-8 (types 35-50 mm. Salta, Argentina, Coll. Borelli, and Steinbach).

*micracanthus* Regan. 39.

*pppp.* A series of four to five dark oblong spots, the third below the adipose, a similar series on the back; dorsal dusky anteriorly, usually with spots on the rays, anal sometimes with a spot. Head 3.75; depth 3; eye 4.5 in head, near middle of head; interorbital 2.5 in the head. Suborbital narrow; barbel nearly reaching gill-opening. Dorsal I, 6-7; spine .60 to .66 the



- length of head; first and second rays longest, the edge of fin slightly convex; base about equal to distance from adipose fin, which is preceded by one or two median scutes. Anal I, 6. Pectoral spine extending to base of pelvics. Scutes 22  $23/20$ ; humeral shields not in contact below, each separated by one and one-half scutes from base of pelvic fin. A lateral series of four or five dark oblong spots, the third below the adipose fin; a similar series of spots on the back; dorsal dusky anteriorly and usually with spots on the rays; caudal usually barred with series of spots; lower fins immaculate, or anal sometimes with a spot. . . . . *microcephalus* Regan. 40.
- oo. Not as above. Three rows of elongate grayish violet spots over the upper two-thirds of the body. A nearly black, sharply outlined band along the upper half of the dorsal, not quite reaching the posterior margin of the fin. Snout not as deep and body more elongate than in *C. julii*. Snout and interorbital equal, 2 in the head, eye 5 to 6 in the head. Head 3.25 to 3.5; depth at the genital opening, 3 to 3.25 (rarely 4); D. I, 8; A. I, 6; lateral plates  $\frac{22 \text{ to } 25}{22 \text{ to } 23}$  (Steindachner). . . . . *raimundi* Steindachner. 41.
- mmm. A dark spot at the base of the spine and another near the tip of the first three rays. A second spot on the sides near the back at the base of the last dorsal rays, and a third just under the adipose spine. Four or five large dark spots along the lateral line and two or three much smaller ones below it, one just beyond the tip of the pectorals and a second above the anal. Anal unmarked. Dorsal spine short, 1.6 in the head, equal to the snout plus half the eye, shorter than the pectoral spine. Snout 2 in the head. Eye 2 in the snout, 3.5 to 4 in the head, and 1.7 to 1.9 in the interorbital. One or two azygous plates. Head 3 to 3.3; depth 2.66 to 3; D. I, 8; A. I, 6; lateral plates  $\frac{22}{21}$ .  
*garbei* von Ihering. 42.
- ll. Dorsal variously marked with interrupted cross-bars (young of *kroneri* with the dark bars more or less confluent in front near the base), face with distinct markings.
- g. Snout with marblings or worm-shaped marks.
- r. Marbling extending over the head, neck, and humeral processes in the female and to the vertical from the last dorsal rays in the males, more restricted in young and those of the type of *eigenmanni*. Male with a broad black band down the lateral line subtended by a satiny white stripe and then by a much narrower black stripe; the region above the lateral band brownish, crossed by one large blackish

blotch just below the last dorsal rays, and another just below the adipose. Markings of the female similar, except that the broad lateral band is irregularly interrupted and even reduced to a series of three or four backwardly pointing V's in some. The satiny white stripe is lacking. Dorsal fin in males reaching the adipose, when depressed; reaching the anterior azygous plate in females. Pectorals a little longer than the dorsal. Dorsal spine short, 2 in the head. Side of the snout with stiff bristles in the male. Snout long, 1.5 to 1.2 in the head. Eye small, 3 to 3.6 in the snout, 5 to 5.5 in the head, and 1.4 to 2 in the interorbital. Head a little greater than the depth, 3.4 to 3.5; depth 3.5 to 3.6, D. I, 7-8; A. I, 5.5 to 6; lateral plates  $\frac{24-26}{22-23}$ . Six azygous plates. . . *kronci* Mirando Ribeiro. 43.

rr. Head dark, with a worm-shaped mark on the snout; a large unbroken spot on the lower part of the side between the ventrals and anal. Dark stripe along the lateral line often ending in a caudal spot; dorsal region checkered. Four series of spots across the dorsal. Much like *nattereri* in morphological characters (von Ihering).

*nattereri triseriatus* v. Ihering. 44.

qq. Snout thickly sprinkled with small dark dots or distinct round dark spots.

s. Head with very numerous small black chromatophores; humeral processes dark; sides with a row of small dark spots on either side of the lateral line, three very large dark spots along the lateral line, a broken stripe along the middle of the upper series of plates, sometimes confluent in places with the large spots of the lateral line, occiput, dorsal plate, and back just behind the dorsal and adipose. Dorsal of male with five cross-bars. Anal and ventral with a large central dark spot. Pectorals cross-banded. Dorsal of the male reaching beyond the adipose, not quite reaching the adipose in the female. Pectorals reaching the tip of the ventrals in the male, reaching the middle of the ventrals in the females. Dorsal spine straight and strong, 1.1 to 1.2 in the head. Snout 2 in the head. Eye larger than in *kronci*, 1.5 to 2+ in the snout, 3.5 to 4 in the head, and 1.7 to 1.8 in interorbital. One or two azygous plates. Head 3.3 to 3.5; depth 2.7 to 2.8; D. I, 7; A. I, 6; lateral plates  $\frac{23}{20-21}$ . . . *paleatus* (Jenyns). 45.

ss. Dorsal with two or three interrupted cross-bars. Head and snout with numerous round brown spots a little smaller than the pupil. Sides with five or six irregular

longitudinal series of slightly larger spots both above and below the lateral line; a group of five or six fainter spots just above the anal. Adipose and anal with a series of small dark spots. Dorsal spine short, 1.5 in the head, shorter than the pectoral spine by three-fourths the diameter of the eye. Two azygous plates. Snout narrow, 1.6 to 1.8 in the head. Eye 1.9 in the snout, 3.5 to 3.8 in the head, 1.7 in the interorbital. Head 3.2 to 3.3; depth 2.5 to 3; D. I, 8; A. I, 6; lateral plates  $\frac{22}{20}$ ; . . . . . *multimaculatus* Steindachner. 46.

*aaa.* An intense black hastate spot at the base of the caudal fin, margined behind with white, and terminating the black lateral band. A black or blackish line on either side from a short distance behind the ventrals to behind the anal.

*l.* Pectoral spine a little longer than the dorsal spine, weakly serrate along both margins. Lateral band and stripe on the ventral plates jet-black and very prominent. Eye large, 1.5 in the snout, 3.5 in the head, 2 in the interorbital. Head 3.3; depth 2.75; D. I, 7-8; A. 7-8; lateral line  $\frac{22}{20}$ .

*hastatus* Eigenmann and Eigenmann. 47.

*ll.* Pectoral spine longer than the dorsal spine, its surface striate, comparatively free from serrations. Lateral band a narrow, dusky line, and the stripe on the ventral plates rather faint, at least toward the anal. Eye large, 1 in the snout, 3 in the head, 1.66 in the interorbital. Head 3.5; depth 2.5; D. I, 7; P. I, 7; V. 7; A. I, 6. . . . . *australis* Eigenmann and Ward. 48.

## 20. *Corydoras elegans* Steindachner.

*Corydoras elegans* STEINDACHNER, "Ichthyologische Beiträge," V, 1876, 93 (Cudajas; Teffé).

4227 I. U. Three, about 49 to 55 mm. Cudajas.

## 21. *Corydoras nattereri* Steindachner.

(Plate XXXI, figs. 1, 1a, 1b.)

*Corydoras nattereri* STEINDACHNER, "Ichthyologische Beiträge," V, 1876, 95, pl. XI, fig. 1-1b (Rio Janeiro).—EIGENMANN AND EIGENMANN, Occasional Papers, Cal. Acad. Sci., I, 1890, 470.

3487 C. M. Eleven, 50 to 69 mm. Morretes, Jan. 2 and 3, 1908. Coll. Haseman.

3488 C. M. Five, 27 to 46 mm. São João da Barra, June 22, 1908. Coll. Haseman.

3489 C. M. Nineteen, 32 to 62 mm. Entre Rios, June 1, 1908. Coll. Haseman.

- 3490 C. M. Forty-three, 26 to 50 mm. Campos, June 15, 1908  
Coll. Haseman.
- 3491 C. M. Two, 37 and 42 mm. Lagoa Feia Tocas, June 27, 1908.  
Coll. Haseman.
- 3492 C. M. One, 43 mm. San Joaquin, Sept. 6, 1909. Coll. Haseman.
- 3493 C. M. Three, 49 to 51 mm. Campos, June 15, 1908. Coll.  
Haseman.
- 3494 C. M. Nine, 26 to 57 mm. Morretes, Jan. 4, 1909. Coll.  
Haseman.
- 3495 C. M. Ten, 27 to 41 mm. Entre Rios, June 1, 1908. Coll.  
Haseman.

22. *Corydoras juquiaë* von Ihering. (Plate XXVII, fig. 1.)

*Corydoras juquiaë* VON IHERING, Notas Preliminares, I, 1907, 37.

- 10996 I. U. M. Type, 66 mm., Rio Juquiá, Poci Grande, von  
Ihering.
- 3544 C. M. One, 77 mm., Xiririca, Rio Riberia, Dec. 8, 1908.  
Coll. Haseman.

23. *Corydoras microps* Eigenmann and Kennedy.

*Corydoras microps* EIGENMANN and KENNEDY, Proc. Acad. Nat. Sci. Phila.,  
July, 1903, 506 (Paraguay).

*Corydoras undulatus* REGAN, Ann. and Mag. Nat. Hist., (8) X, 1912, 217 (La Plata).

[Regan makes *Corydoras microps* Eigenmann and Ward a new species and makes the *Corydoras microps* of Eigenmann and Kennedy a synonym of *æneus*. It is possible that *microps* Eigenmann and Kennedy is a synonym of *æneus*. It is certain that most of the specimens recorded by Eigenmann and Ward are identical with those recorded by Eigenmann and Kennedy. It is possible that the spotted specimens, one of which is figured by Eigenmann and Ward, offer an excuse for the species *undulatus*. C. H. Eigenmann.]

- 10210 I. U. M. Four, 38 to 64 mm. Mountain brooks, Paraguay.  
Coll. J. D. Anisits.
- 10153 I. U. M. Six, 25 to 36 mm. (Without caudal), Puerto Max,  
Forest lagoons. Coll. J. D. Anisits.
- 9892 I. U. M. One, type, 33 mm. (Without caudal), Rio Branco,  
Matto Grosso, June 1, 1901. Coll. J. D. Anisits.
- 9895 I. U. M. Two, cotypes, 25 and 26 mm. Arroyo Pypucu, June  
1, 1901. Coll. J. D. Anisits.

- 9893 I. U. M. One, cotype, 53 mm. Aregua Laguna, Ypacari, June, 1901. Coll. J. D. Anisits.
- 10201 I. U. M. Five, 28 to 39 mm. Villa Rica. Coll. J. D. Anisits.
- 954a C. M. One, Aguadas near Arroyo Trementina. Coll. J. D. Anisits.
- 3478 C. M. Two, 41 and 44 mm., São Francisco, June 10, 1909. Coll. Haseman.
- 3479 C. M. Sixteen, 42 to 69 mm. Sapucay, April 2 and 5, 1909. Coll. Haseman.
- 3480 C. M. Thirteen, 34 to 70 mm. Urucum Mts., Corumbá, May 2, 1909. Coll. Haseman.
- 3481 C. M. One, 49 mm., Puerto Suarez, E. Bolivia. Coll. Steinbach.
- 3482 C. M. Four, 40 to 50 mm. Banhurie S. P., creek of Rio Tieté. Coll. Haseman.
- 3483 C. M. One, 51 mm. Cacequy, Jan. 31, 1909. Coll. Haseman.
- 3484 C. M. One, 40 mm. Corumbá, April 27, 1909. Coll. Haseman.
- 3485 C. M. Eleven, 41 to 61 mm. Salto das Cruzes, Rio Tieté, Sept. 22, 1908. Coll. Haseman.
- 3496 C. M. Two, 55 and 59 mm. Rio de Boa Ventura, June 16, 1909.

#### 24. *Corydoras melanotænia* Regan.

*Corydoras melanotænia* REGAN, Ann. & Mag. Nat. Hist. (8), X, 1912, 217 (Honda).

#### 25. *Corydoras macrosteus* Regan.

*Corydoras macrosteus* REGAN, Ann. & Mag. Nat. Hist. (8), X, 1912, 219 (Rio Piracicala, São Paulo, Brazil).

#### 26. *Corydoras æneus* (Gill).

*Hoplosoma æneum* GILL, Ann. Lyc. Nat. Hist. New York, VI, 1858, 43 (Trinidad, W. I.).

(?) *Corydoras venezuelanus* VON IHERING, Rev. Mus. Paulista, VIII, 1910, 383 (Rio Cabriale, Venezuela).

11301 I. U. Three, 60 to 80 mm. Trinidad, W. I.

Gill's original description of *H. æneum* and the description of *C. venezuelanus* differ in a few particulars. *H. æneum* is said to be, "greatest height rather less than a fifth in the total length," while *C. venezuelanus* is given, greatest height 2.66 in the length to the base of the caudal. The interorbital is less than snout in *æneus* and slightly

more than the snout in *venezuelanus*. The three specimens of *ancus* at hand came from Trinidad, but agree even more perfectly with the description of *venezuelanus* than with that of *ancus*. The specimens from which *ancus* was described were 63.5 to 101.6 mm.; those from which *venezuelanus* was described were 35-45 mm., which may account for the variation in proportion of height to length found by the two authors.

27. *Corydoras virescens* Ribeiro. (Plate XXVII, fig. 2.)

*Corydoras virescens* RIBEIRO, Comm. Linh. Electr. Est. de Matto-Grosso ao Amazonas, Ann. No. 5, Hist. Nat. Zoöl., 1912, 16 (Caceres).

- 3545 C. M. 47 mm. Caceres, May 26, 1909. Coll. Haseman.  
 3523 C. M. Thirty-eight, 23-48 mm. Caceres, May 26, 1909. Coll. Haseman.  
 3524 C. M. Nine, 23 to 45 mm. Jaurú, June 2, 1909. Coll. Haseman.  
 3525 C. M. One, 24 mm. Rio Jaurú, June 3, 1909. Coll. Haseman.  
 3526 C. M. Four, 34 to 43 mm. (without caudal), San Francisco, June 10, 1909. Coll. Haseman.  
 3527 C. M. One, 45 mm. Rio Santa Rita, June 12, 1909. Coll. Haseman.  
 3528 C. M. Twelve, 16 to 21 mm. (without caudal), Bastos, June 26, 1909. Coll. Haseman.  
 3529 C. M. Two, 29 to 33 mm. Maciel, Rio Guaporé, July 9, 1909. Coll. Haseman.  
 3530 C. M. One, 30 mm. Maciel, Rio Guaporé, July 23, 1909. Coll. Haseman.

[This species was described as new by Mrs. Ellis. The name has been suppressed, but her description is allowed to stand.—C. H. Eigenmann.]

Head to the end of the opercle 3 to 3.5; depth  $2\frac{1}{2}$  to 3 (in very small); width 2 to 3.8; D. I, 8; A. I, 6; P. I, 7; lateral plates  $\frac{22}{19}$  to  $\frac{23}{20}$ ; eye 1.5 to 2 in the snout, 3 to 3.3 in the head, 1.3 to 2 in the inter-orbital.

Moderately compressed throughout, becoming much stouter with age; highest at the dorsal spine. Dorsal profile steep in front of the nares. Ventral profile nearly straight, or only gently bowed. Caudal peduncle rather sharply constricted. Coracoid processes not expanded

below: breast and belly in front of the ventrals naked. Scutes meeting along the mid-ventral line behind the ventrals: width of the head 1.1 to 1.25 in its length, eyes lateral. Frontal fontanel small, making a small niche in the occipital, reaching the level of the pupil in front. Snout naked beyond the suborbitals, bluntly conical, more perpendicular in front in young than in old specimens. Rictal barbels equal, reaching the vertical from the middle of the eye, those of the lower lip short. Mouth small and inferior.

Scutes entirely covering the sides. Four scutes meeting on the back just behind the dorsal: three azygous plates in front of the adipose. Scutes somewhat roughened over the surface and along the edge.

Origin of the dorsal a little nearer the snout than the caudal. Dorsal spine straight and well developed, about 1.2 in the head: a little rough in front, finely toothed behind, the first two rays very little longer than the spine. Pectoral spine half the diameter of the eye, longer than the dorsal spine, equal to the head, otherwise like the dorsal spine, reaching the second scute in front of the tips of the ventrals. Adipose spine very slightly curved. Anal spine weak, rough. Anal just reaching the lower caudal lobe. Ventrals short, 1.5 to 1.75 in the distance from their base to the anal. Caudal the diameter of the eye longer than the head.

Top of head, back, and upper part of sides dark, yellowish below. The dark color of the head, especially in smaller specimens, due to numerous scattered chromatophores, small on the snout, larger near the dorsal spine: the color of the sides due to a dark brown stripe, along the distal half of each scute, more distinct near the lateral line, diffuse near the dorsal line on the upper plates and vanishing near the ventral line on the lower plates. Opercle with light blue iridescence, which sometimes extends on to the humeral plate. Fins all unmarked, except the ventrals, which are slightly dusky.

28. *Corydoras armatus* (Günther). (Plate XXVII, fig. 3.)

*Callichthys armatus* GÜNTHER, Proc. Zool. Soc. London, 1868, 230, fig. 1 (Xeberos and Huallaga).

3531 C. M. Two, 44 and 45 mm. San Joaquin, Sept. 5, 1909. Coll. Haseman.

3532 C. M. Four, 54 to 61 mm. San Joaquin, Sept. 6, 1909. Coll. Haseman.

- 3533 C. M. One, 40 mm. Santarem, Dec. 9, 1909. Coll. Haseman.  
 3534 C. M. Four, 43 to 44 mm. Santarem, Dec. 15, 1909. Coll.  
 Haseman.

29. *Corydoras polystictus* Regan.

*Corydoras polystictus* REGAN, Ann. & Mag. Nat. Hist. (8) X, 1900, 216 (Descalvadas,  
 Matto Grosso).

30. *Corydoras acutus* Cope.

*Corydoras acutus* COPE, Proc. Acad. Nat. Sci. Phila., 1872, 281 (Ambryacu).  
 No specimens.

31. *Corydoras aurofrenatus* Eigenmann and Kennedy.

*Corydoras aurofrenatus* EIGENMANN and KENNEDY, Proc. Acad. Nat. Sci. Phila.,  
 1903, 507 (Aguada, near Arroyo Trementina).

9891 I. U. M. Type, 55 mm. Aguada, near Arroyo Trementina,  
 Dec., 1900. Coll. J. D. Anisits.

3497 C. M. Two, 48 and 59 mm. Caceres, May 26, 1909. Coll.  
 Haseman.

10193 I. U. M. One, 30 mm. Villa Rica.

3498 C. M. One, 44 mm. Caceres, May 24, 1909. Coll. Haseman.

3499 C. M. One, 41 mm. Caceres, May 25, 1909. Coll. Haseman.

32. *Corydoras treitlii* Steindachner.

*Corydoras treitlii* STEINDACHNER, Akad. Anzeiger, No. XXVII, 1900 (Paranahyba).  
 No specimens.

33. *Corydoras ehrhardti* Steindachner.

*Corydoras ehrhardti* STEINDACHNER, Akad. Anzeiger, No. VIII, 1910, March 10  
 (Jaraguá).

*Corydoras meridionalis* VON IHERING, Rev. Mus. Paulista, VIII, Jan. 7, 1910, 380,  
 (Colonia Hansa in Santa Catharina).

No specimens.

34. *Corydoras flaveolus* von Ihering. (Plate XXVIII, fig. 1.)

*Corydoras flaveolus* VON IHERING, Rev. Mus. Paulista, VIII, 1910, 386 (Rio  
 Piracicaba above waterfall of same name).

3521 C. M. One, 65 mm. Sapucay, April 2, 1909. Coll. Haseman.

3522 C. M. Two, 52 and 68 mm. Sapucay, April 5, 1909. Coll.  
 Haseman.



35. *Corydoras amphibelus* Cope.

*Corydoras amphibelus* COPE, Proc. Acad. Nat. Sci. Phila., 1871, 282 (Ambyiacu River).

No specimens.

36. *Corydoras punctatus* (Bloch).

*Cataphractus punctatus* BLOCH, Ausl. Fische, pl. 377, fig. 2.—BLOCH and SCHNEIDER, Syst. Ichthyol., 1801, 108.

*Corydoras punctatus* EIGENMANN and EIGENMANN, Occasional Papers Cal. Acad. Sci., I, 1890, 472; Eigenmann, Mem. Carnegie Mus., V, 1912, 220, pl. XXIV, fig. 3.

*Corydoras melanistiis* REGAN, Ann. & Mag. Nat. Hist. (8), X, 1912, 216 (Essequibo).

Regan, perhaps properly, regards *Corydoras punctatus* Eigenmann as distinct from *Corydoras punctatus* (Bloch). Bloch's figure represents his *punctatus* with vertical series of spots on the caudal.

1560 C. M., 11977 I. U. M. Mud-flats of Demerara River below Wismar, British Guiana, 1908. Coll. Eigenmann.

1561 C. M., 11978 I. U. M., Erukin, British Guiana, 1908. Coll. Eigenmann.

1562 C. M., 11979 I. U. M. Malali, British Guiana, 1908. Coll. Eigenmann.

1563 C. M. One below Packeoo Falls, British Guiana.

1564 C. M., 11980, I. U. M. One, 29 mm. Tumatumari, British Guiana, 1908. Coll. Eigenmann.

1566 C. M., 11981 I. U. M. One, 50 mm. Kumaka, British Guiana, 1908. Coll. Eigenmann.

1567 C. M. Wismar. Coll. Eigenmann.

1568 C. M., 11982 I. U. M. Konawaruk, British Guiana, 1908. Coll. Eigenmann.

1569 C. M., 11983 I. U. M. Rockstone, British Guiana, 1908. Coll. Eigenmann.

1565 C. M., 11984 I. U. M. Creek below Potaro Landing, 1908. Coll. Eigenmann.

3500 C. M. Two, 51 and 55 mm., Santarem, Dec. 15, 1909, coll. Haseman; forty-five, 29 to 53 mm., Gluck Island, British Guiana, coll. Ellis; one, 33 mm., Hubabu Creek, British Guiana, coll. Ellis.

37. *Corydoras julii* Steindachner.

*Corydoras julii* STEINDACHNER, Akad. Anzeiger, XXVII, 1906 (Parahim, outlet of Lake Paranagua).

No specimens.

38. *Corydoras trilineatus* Cope. (Plate XXX, figs. 2, 2a.)

*Corydoras trilineatus* COPE, Proc. Acad. Nat. Sci. Phila., 1871, 281, pl. 6, fig. 2 (Ambyiacu).

*Corydoras agassizii* STEINDACHNER, "Ichthyologische Beiträge," V, 1876, 90 and 186, pl. 12, fig. 2-2a (Tabatinga).

No specimens.

39. *Corydoras micracanthus* Regan.

*Corydoras micracanthus* REGAN, Ann. & Mag. Nat. Hist. (8), X, 1912, 211 (Salta, Argentina).

No specimens.

40. *Corydoras microcephalus* Regan.

*Corydoras microcephalus* REGAN, Ann. & Mag. Nat. Hist. (8), X, 1912, 211 (La Plata).

No specimens.

41. *Corydoras raimundi* Steindachner.

*Corydoras raimundi* STEINDACHNER, Akad. Anzeiger, February, 1907, No. VI, 84, (Victoria, in brooks tributary to Rio Paranahyba).

No specimens.

42. *Corydoras garbei* von Ihering. (Plate XXVIII, fig. 2.)

*Corydoras garbei* VON IHERING, Rev. Mus. Paulista, VIII, Jan. 1, 1910, 382 (Rio São Francisco).

3518 C. M. Twenty-two, 25 to 44 mm. Joazeiro, Nov. 28, 1907. Coll. Haseman.

3519 C. M. Twenty-nine, 29 to 39 mm. Lagoa Pereira, Dec. 23, 1907. Coll. Haseman.

3520 C. M. Two, 33 and 41 mm. Barreiras, Lagoas of Rio Grande, Jan. 3 and 4, 1908. Coll. Haseman.

43. *Corydoras kronei* Miranda Ribeiro. (Plate XXVIII, fig. 3; Plate XXIX, figs. 1-3.)

*Corydoras kronei* MIR. RIBEIRO, A Lavoura, Anno XI, No. 5, May, 1907, 189.

*Corydoras eigenmanni* VON IHERING, Notas Preliminares, S. Paulo, 9. Oct., 1907, 34.

10795 I. U. M. Two (type and cotype of *C. eigenmanni* von Ihering), 52 and 57 mm. Cubatão, Raiz da Serra, S. P. Coll. Haseman.

3501 C. M. Twelve, 29 to 42 mm. Alagoinhas, Rio Catu, March 4, 1908. Coll. Haseman.

- 3502 C. M. Fifteen, 43 to 85 mm. Raiz da Serra, Rio Mogy, July 27, 1908. Coll. Haseman.
- 3503 C. M. Six, 25 to 73 mm. Cubatos, Aug. 1, 1908. Coll. Haseman.
- 3504 C. M. One, 26 mm. Barreiras, Lagoas of Rio Grande, Jan. 3 and 4, 1908. Coll. Haseman.
- 3505 C. M. Thirteen, 25 to 66 mm. Aqua Quente, Nov. 27, 1908. Coll. Haseman.
- 3506 C. M. Three, 28 to 76 mm. Iporanga, Dec. 1, 1908. Coll. Haseman.
- 3507 C. M. Three, 52 to 85 mm. Ribeiro de Iguape, No. 25 of Krone collection, Dec. 13, 1908. Received from Haseman.
- 3508 C. M. Six, ♂, 70 to 104 mm. Morretes, Parana, Jan. 2, 1909. Coll. Haseman.
- 3509 C. M. Ten, ♀, 34 to 95 mm. Morretes, Parana, Jan. 2, 1909. Coll. Haseman.
- 3510 C. M. Eight, 53 to 100 mm. Morretes, Parana, Jan. 3, 1909. Coll. Haseman.
- 3511 C. M. One, 24 mm. Morretes, Parana, Jan. 4, 1909. Coll. Haseman.

The type and cotypes of *C. eigenmanni* are young females and have the markings more or less reduced on the sides. The present specimens afford very complete series from these paler individuals to the completely pigmented adult males.

#### 44. *Corydoras triseriatus* von Ihering.

*Corydoras natereri triseriatus* VON IHERING, Rev. do Mus. Paulista, VIII, Jan. 1, 1911, 386 (Rio Doce).

No specimens.

#### 45. *Corydoras paleatus* (Jenyns). (Plate XXX, figs. 1, 1a, 1b.)

*Callichthys paleatus* JENYNS, Voy. Beagle, IV, 1842, 113.

*Corydoras paleatus* EIGENMANN and EIGENMANN, Occasional Papers Cal. Acad. Sci., I, 1890, 471.

*Corydoras marmoratus* STEINDACHNER, Denk. Akad. Wiss. Wien, XLI, 1879, 45, pl. 5, fig. 1 (La Plata).

- 4884 I. U. M. Nine, 25 to 50 mm. Rio Grande do Sul, von Ihering.
- 3512 C. M. Fifty-six, 32 to 52 mm. Porto Alegre, Jan. 21, 1909. Coll. Haseman.

- 3513 C. M. Twenty-one, 18 to 55 mm. (without the caudal), Porto Alegre, Jan. 19 and 21, 1909. Coll. Haseman.
- 3514 C. M. Twenty, 27 to 57 mm. Cachoeira, Jan. 26, 1909. Coll. Haseman.
- 3515 C. M. One, 56 mm. Rio Jacahy, Jan. 27, 1909. Coll. Haseman.
- 3516 C. M. Twenty-two, 31 to 71 mm. Cacequy, Jan. 31, 1909. Coll. Haseman.
- 3517 C. M. Five, 33 to 58 mm. Uruguayana, February 7, 1909. Coll. Haseman.

46. **Corydoras multimaculatus** Steindachner. (Plate XXIX, fig. 4.)

*Corydoras multimaculatus* STEINDACHNER, Akad. Anzeiger, No. XVII, July, 1907, 291 (Rio Preto, Santa Rita).

- 3496 C. M. Two, 35 and 41 mm. Santa Rita, Jan. 24, 1908. Coll. Haseman.

47. **Corydoras hastatus** Eigenmann and Eigenmann.

*Corydoras hastatus* EIGENMANN and EIGENMANN, Proc. Cal. Acad. Sci., 2d Ser., 1888, 166 (Villa Bella). Occasional Papers Cal. Acad. Sci., I, 1890, 474 (Villa Bella).

No specimens.

48. **Corydoras australis** Eigenmann and Ward.

*Corydoras australe* EIGENMANN and WARD, Ann. Carnegie Museum, IV, 1907, 123 (Corumbá, tributary of Rio Pilcomayo).

- 948 C. M. One (cotype). Corumbá. Coll. J. D. Anisits.
- 3535 C. M. One, 21 mm. Puerto Suarez, Bolivia. Coll. Steinbach.
- 3536 C. M. Six, 21-29 mm. Puerto Suarez, Bolivia, May 6-7, 1909. Coll. Haseman.
- 3537 C. M. Nine, 21-28 mm. San Joaquin, Sept. 4, 1909. Coll. Haseman.
- 3538 C. M. One, 19 mm. Caceres, May 24, 1909. Coll. Haseman.
- 10129 and 10130 I. U. M. (type and cotype of *C. australis* Eigenmann and Ward), 15 and 19 mm. without caudal, Corumbá. Coll. J. D. Anisits.
- 10192 I. U. M. One, 20 mm. Rio Pilcomayo.

Genus *OSTEOGASTER* Cope.<sup>5</sup>

49. *Osteogaster eques* (Steindachner). (Plate XXX, figs. 3, 3a.)  
*Corydoras eques* STEINDACHNER, "Ichthyologische Beiträge," V, 1876, 92, pl. 12, fig. 3-3a (Teffé; Cudajas).—EIGENMANN and EIGENMANN, Occasional Papers Cal. Acad. Nat. Sci., I, 1890, 466.  
*Osteogaster eques* COPE, Proc. Am. Philos. Soc., XXXIII, 1894, 102.  
 4226 I. U. M. One, female, 32 mm. Cudajas, a very poor specimen.

50. *Osteogaster splendens* Castelnau.

- Callichthys splendens* CASTELNAU, Anim. de l'Am. du Sud, Poissons, 1855, 39, pl. 18, fig. 3 (Rio Tocantins).  
 No specimens; known only from description and figure of Castelnau.

## APPENDIX.

[After the foregoing paper had been set up and was ready to be printed, the Editor received the following description of a new species from Professor Eigenmann. It is appended to Mrs. Ellis' monograph for the purpose of bringing our knowledge of the group herein treated down to the moment of going to press, March 1, 1913.—*Editor.*]

51. *Hoplosternum magdalenæ* Eigenmann MS.

- Callichthys (Hoplosternum) thoracatus* (non Cuvier & Valenciennes) STEINDACHNER, Zur Fish-Fauna des Cauca und der Flüsse bei Guayaquil, 1880, 14. (Cauca near Caceres).

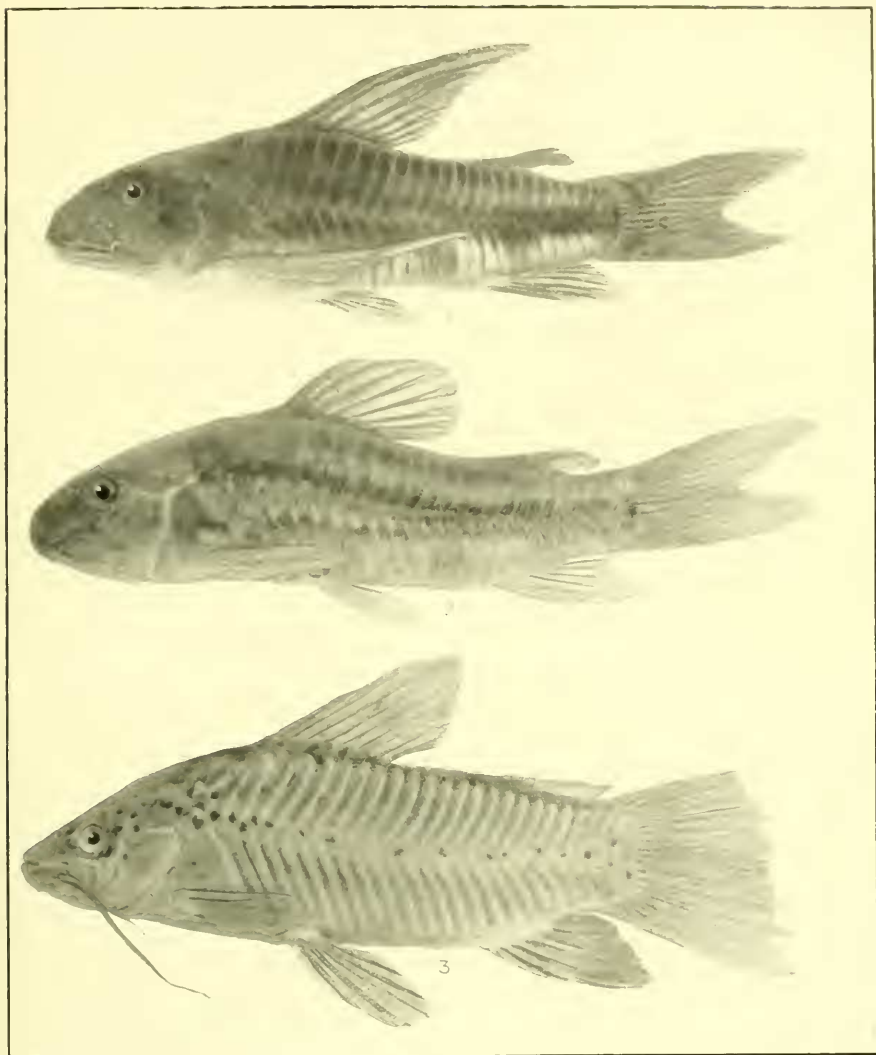
The specimens mentioned by Steindachner are much lighter in color and have the caudal spotted with dark, the base with a light bar, followed in one specimen with an ill-defined darker band. He had three specimens 7 cm. long. This species is quite distinct from *thoracatum* and is most nearly like *H. pectoralis* Boulenger from the Paraguay basin.

Type, 107 mm. Soplaviento, U. S. of Colombia, C. M. No. 5081.  
 Paratypes, 59 specimens. Soplaviento, C. M. No. 5082a-j; I. U. M. No. 12836.

Paratypes, one specimen, Calamar Cienega. C. M. No. 5083.

Head to end of opercle 3-3.5 in the length; depth 3.5; D. I, 8; A. I, 6. Plates  $\frac{25}{23}$ — $\frac{26}{23}$ ; eye 6 in head to end of opercle, 4 in interorbital

<sup>5</sup> Mr. Regan considers *Osteogaster eques* Steindachner to be a *Corydoras* allied to *nattereri* and *macrosteus*. *Osteogaster splendens* Castelnau he considers to be a member of the genus *Brochis*.



1. *Scleromystax barbatus* (Quoy & Gaimard). ♂, 60 mm., C. M. No. 3477.
2. *Scleromystax barbatus* (Quoy & Gaimard). ♀, 62 mm., C. M. No. 3477.
3. *Cascadura maculocephala* Ellis. (Type) 66 mm., C. M. No. 3539.